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Wage and Compensation Inequality —How Different?[ψ]

by

Jan Selén* and Ann-Charlotte Ståhlberg**

Abstract

The paper compares the distribution of individuals' wage to the distribution of labor compensation when important non-wage benefits are included. In our study for Sweden focus is on pensions, survivors' benefits and sickness benefits. These are non-observed. A method of estimating these benefits indirectly is proposed and used to examine their contributions to overall earnings inequality. We find that insurance benefits increased annual earnings inequality by 40 percent. The share of the benefits to total earnings is 22 percent. The effect of the benefits is minor for blue collars and municipal white collars, while it is high for private white collars.

Keywords: Non-wage benefits; Compensation inequality; Wage inequality; Pension benefits; Sickness benefits; Survivors' benefits; Collective-agreement insurance; Social insurance

JEL classification: J32; H55

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* Jan Selén, FIEF, Wallingatan 38, SE-111 24 Stockholm, Sweden. Email: Jan.Selen@fief.se

**Ann-Charlotte Ståhlberg is at the Swedish Institute for Social Research, Stockholm University, SE 10691 Stockholm. Email: Ann-Charlotte.Stahlberg@sofi.su.se

1. Introduction

Although there has been a great deal of empirical research on wage inequality, there has been relatively little empirical work on compensation inequality. Compensation is a more relevant concept than wages if one is concerned about measuring incentives to work or incentives to hire, or if one is interested in broader aspects of well-being.

In the U.S., fringe benefits represent a substantial portion of compensation because they include things like health insurance and pension benefits. Bloom and Freeman (1992) examined the contribution of fringe benefits to the growth in overall earnings inequality in U.S. Their results indicated that focus solely on wage earnings understated inequality in the economy. Lazear and Rosen (1987) compared the distribution of individuals' wages to the distribution of their wage plus pension benefits by estimating "typical" workers' pension benefits. They found that pension benefits increased earnings inequality. Benedict and Shaw (1995) used individual-level pension information in their study of how occupational pension benefits affected the distribution of earned income in the U.S. Annual pension accrual values for each individual were obtained by calculating the expected present values of pension liabilities in year *t* and *t-1* and differencing them to get the annual accrual. Pensions increased annual earnings inequality by about three percent among all employed, and by 21 per cent among unionised workers. They also found that public pensions strongly reduced inequality in the distribution of expected lifetime earnings.

The intent of this paper for Sweden is to compare the distribution of individuals' wage income to the distribution of labor compensation when important non-wage benefits are included. It is often thought that non-wage benefits are relatively unimportant in Sweden (and in several European countries) because the government provides pensions and sickness benefits. However, this is a misstatement. It is true that the government provides pension plans and sickness benefit insurance but these are tied to employment and are important components of worker compensation. All employees are covered by earnings-related social insurance. In addition, practically all employees are covered by quasi-mandatory collective-agreement insurance schemes financed by payroll contributions, which are non-actuarial on the individual level. There are four main schemes that build on collective bargaining agreements: one for private sector white-collar workers, one for private sector blue-collar workers, one for state employees, and one for local authority and county council employees. They cover the same areas as the social insurance scheme. They raise the level of

compensation especially upon illness and retirement. A second scheme is in particular important to high-wage earners because most of the plans replace earnings above the ceiling in the social insurance scheme.

In this study, focus is on pensions, survivors' benefits and sickness benefits. They compensate for income losses due to retirement, death of a spouse and illness.

There are several reasons why one might expect insurance compensation inequality to differ from wage inequality in a systematic way. The collective-agreement benefit design differs between sectors and in particular, favours full career, well-paid white-collar workers. One aspect of non-wage benefits is their potential as a tool for counteracting the effect of the solidarity wage policy. The wage dispersion in Sweden is among the lowest in the world (Katz and Autor, 1999), partly due to the solidarity wage policy. In this case, the implication is that the earnings differentials may increase because of non-wage benefits.

The probability of the insurance situation occurring varies between sexes, marital status, ages etc. The sickness rate is higher for women than for men, higher for blue-collar workers than for white-collar workers and increases with age. The mandatory widow's or widower's pension is of no value for unmarried men and women. Thus, we could expect the non-wage benefit of the sickness benefit insurance to be higher for women than for men *cet.par.* and of the survivors' pension to be higher for married than for singles *cet.par*. On one hand the pension design with unisex life tables favours female employees because the life expectancy of women is higher than that of men, on the other it favours employees with uneven and steep (covered) age-earnings profiles. If the distribution of insurance cover is skewed toward high-income earners, insurance benefits will raise earnings inequality even if there are wage compensation differentials.

In the year of our study for Sweden, 1995, social and negotiated collective-agreement insurance schemes are defined benefit (DB) plans. The individual non-wage benefits of the insurance coverage are non-observed. In the paper, a method of investigating these values indirectly is proposed and used for examining the contribution of benefits to the overall earnings inequality. We estimate each non-wage benefit under the assumption that it equals the premium required for the same benefit payment in a private individual insurance scheme. The annual accrual in the expected present value of a person's pension liabilities from employment is calculated to estimate his or her pension income acquired during the year. The probability of surviving is diversified according to sex. We determine the survivors' benefit income by calculating its actuarial value, taking into account differences in occupational sector design, annual

earnings, age, sex, life expectancy, age of the spouse/cohabite, his or her life expectancy, number of children and the children's ages. The employee's sickness benefit income is estimated by calculating the actuarial value of sickness benefits when the risk of sickness is diversified according to sex, age, socio-economic group and occupational sector.

Our estimations are based on a representative sample of the Swedish adult population 20-60 years old. More precisely we employ a part of the household income survey for 1995 (Statistics Sweden). This survey is based on about 10 000 households in all. Individuals are interviewed concerning labor market status, household structure and housing conditions. The interviews are supplemented by register data on income from different sources and with other variables. The non-response rate for 1995 was below 20 percent. Differential non-response is accounted for by adjusted sampling weights.

Using data on annual before-tax wages and estimating the before-tax benefits of the earnings-related security package of social and collective-agreement insurance, we investigate the inequality implications of the broader measures. How much of inequality in total wages can thus be attributed to money wage and how much to insurance cover, regarding old age pension, survivors' pension and sickness benefit income? Are there differences between men and women in the way these non-wage benefits affect inequality? Does the inequality structure of the benefits vary across occupational groups? How are different wage groups affected?

We examine some inequality measures such as the coefficient of variation and Lorenz curves. Decomposing is used to enhance under-standing.

The paper is organised as follows: Section 1 gives the introduction. Section 2 presents the method of investigating the non-observed benefits. The sample is presented in section 3. Inequality measures and decomposition methods are described in section 4 and the results are given in the following section 5. Section 6 concludes the study.

2. Estimating non-wage benefits

Pension benefit income

The annual accrual in the expected present value of pension liabilities from employment during the year *t* is used to estimate the pension income (P) acquired during the year,

$$P = (L_t - L_{t-1}) \times S_{A,N} \times \left[1/(1+r)^{N-A}\right] \times \sum_{i=N}^{D} S_{N,i} \times \left[1/(1+r)^{i-N}\right] \quad (1)$$

where

L_t = annual pension payments earned up to year *t*,
D = age at death,
N = age at retirement,
A = current age,
$S_{A,N}$ = the probability of surviving from age A to age N. $S_{A,N}$ is diversified according to sex,
r = 0.02 the chosen real rate of discount.

Survivors' benefit income

We estimate the individual value of the survivors' benefit Π^{Occ} and Π^{Soc} as follows:

$$p_i \times B_{i,j}^{Occ} + A_j^{Occ} = \Pi_{i,j}^{Occ} \quad (2a)$$

$$p_i \times B_i^{Soc} + A^{Soc} = \Pi_i^{Soc} \quad (2b)$$

where

p_i = the probability of the insurance situation occurring, that is, the mortality risk. This is calculated by age and sex[1],

$B_{i,j}^{Occ}$ = the discounted value of the payments from the collective-agreement insurance scheme *j*. $B_{i,j}^{Occ} = B_{i,j}^{Occ}$(age, married/cohabite, annual

[1] We do not account for differences in death risks between socio-economic groups, but studies suggest that they are to the disadvantage of blue-collar workers, and would decrease their old age pension income and increase their survivors' pension income if they were included (Vågerö and Lundberg, 1995).

wages, marginal tax rate, age of spouse/cohabite, mean life expectancy, number of children, children's ages, rate of discount) according to the survivors' benefit design,

B_i^{Soc} = the discounted value of the payments from the social insurance,

$B_i^{Soc} = B_i^{Soc} = B_i^{Soc}$ (married/cohabite, pension points in the social insurance old age pension scheme, number of years with pension points, marginal tax rate, number of children, children's ages, rate of discount) according to the survivors' benefit design,

A_j^{Occ} = administrative costs of the collective-agreement insurance scheme *j*, A^{Soc} of the social insurance scheme, $A_j^{Occ} = A^{Soc} = 0$,

r = 0.02 the chosen real rate of discount.

Sickness benefit income

The complexity of the sickness benefit design requires data on the expected number of days at the different replacement levels for the first day, days 2-14, days 15-90 and days 91-365. Data on sick-periods are lacking however in our 1995 database and sickness compensation is known only as the year's total for the days after days 1-14 for the sick-periods. We therefore follow the simpler path of Selén and Ståhlberg (2002) where the strategy was to non-parametrically estimate sickness behaviour for different groups, and calculate the benefits under certain assumptions utilising data from 1990 when all sickness compensation was administered by the National social administration and therefore centrally registered. Estimates from Selén and Ståhlberg (2002) concerning sickness benefits by socio-economic group, sector, sex and age group cross-classified (cf. table 4.2 ibid.) are imputed to the individuals in the data-base employed here.

3. Sample presentation and introductory results

The means of the wage variables are shown in Table 1. The major part of the benefits is pensions. The gender differences in the mean values of benefits are larger in the collective-agreement schemes than in the social insurance scheme. However, the female to male mean wage ratio does not

Table 1: Means of wage variables in 100 SEK and non-wage benefit shares. Employees aged 20 to 60. Standard deviations in parentheses, weighted data.

	All	*Female*	*Male*
Annual money wage	1930	1610	2245
	(983)	(645)	(1143)
Annual total wage	2461	2067	2849
	(1779)	(1233)	(2117)
A) Non-wage benefits from the social insurance scheme:			
1 Pension benefits	230	252	226
	(214)	(231)	(195)
2 Sickness benefits	93	100	86
	(45)	(41)	(48)
3 Survivors' benefits	8	6	10
	(9)	(5)	(11)
Non-wage benefits, total (Σ 1,2,3)	340	358	322
	(228)	(247)	(207)
B) Non-wage benefits from the collective-agreement insurance scheme:			
1 Pension benefits	168	79	255
	(1019)	(705)	(1248)
2 Sickness benefits	6	6	6
	(4)	(2)	(4)
3 Survivors' benefits	17	14	20
	(22)	(16)	(27)
Non-wage benefits, total (Σ 1,2,3)	190	99	281
	(1024)	(706)	(1254)
Non-wage benefits from the social insurance and collective-agreement schemes (A+B):			
1 Pension benefits	407	331	481
	(1060)	(769)	(1280)
2 Sickness benefits	99	106	92
	(48)	(43)	(52)
3 Survivors' benefits	25	20	30
	(30)	(20)	(36)
Non-wage benefits, total (Σ 1,2,3)	541	457	603
	(1079)	(784)	(1301)

Non-wage benefit shares, %:			
Total benefits/total wage	17.8	19.0	16.4
Total benefits/money wage	23.9	25.9	22.0
Social insurance benefits/money wage	17.9	21.5	14.4
Collective-agreement insurance benefits/money wage	6.0	4.4	7.5
Pension benefits/money wage	17.0	17.6	16.3
Sickness benefits/money wage	5.6	6.9	4.4
Survivors' benefits/money wage	1.3	1.3	1.3
# of observations	10 954	5 529	5 425

change due to an inclusion of all non-wage insurance benefits. For both money wage and total wage the ratio is about 72 percent.

To get an idea of the magnitudes of the benefit/total-wage ratio and benefit/money-wage ratio in the sample, the shares are shown in the lower part of Table 1. The mean benefit/total-wage ratio is about 18 percent[2] and the mean benefit/money-wage ratio is about 24 percent with 18 percent from the social insurance scheme and 6 percent from the collective-agreement schemes.

The benefit shares are somewhat higher for women than for men. For example, the ratio of average sickness benefits to the money wage is larger for women than for men because the risk of sickness and thus the actuarial value of the insurance provision is higher for women. The average pension benefits relative to the money wage is somewhat higher for women than for men since life expectancy of women is higher than that of men, while the average survivors' benefits relative to the money wage are the same for men and women. To notice is that women get a relatively larger part of the benefits from the social insurance scheme (22 percent) than from the collective-agreement scheme (4 percent). For men the corresponding shares are more even, i.e. 14 percent and 8 percent.

Negative benefits are possible; this occurs for the pension benefits when L_t-L_{t-1} in (1) is negative. Negative benefits may result in a negative total income. This is a rare event for our data and occurs for 29 of the 10 954 individuals, but requires some consideration in an inequality analysis.

[2] The share of benefits to total wage is 22 percent, i.e. 54 100/246 100.

4. Inequality comparison and decomposition methods

Comparisons of inequality for the different income measures will be based on Lorenz curves and inequality indices. We will favour Lorenz consistent inequality measures (see Foster and Ok, 1999). The practical consequence is that the variance of logarithms is excluded and even impossible to use since the pension benefits need not be positive for all individuals.

A measure of inequality used here is the square of the coefficient of variation that is the square of the standard deviation divided by the mean. The relationship of the squared coefficient of variation for total wage CV_T^2 to the corresponding coefficients CV_M^2 and CV_B^2 for the components money wage and benefits, which add up to total wage, is

$$CV_T^2 = (1 - \alpha)^2 \ CV_M^2 + \alpha^2 \ CV_B^2 + 2 \rho \alpha \ (1 - \alpha) \, CV_M \, CV_B \ , \quad (3)$$

where α is the share of total wage from benefits and ρ the correlation between benefits and money wage.

The interpretation of a larger and more positive correlation ρ is a higher incidence of benefits among those with high money wage or a lack of compensating differentials. An increased variation for the benefits will increase total variation according to (3), but if the benefits only are a small share of total wage and thus α is small, then the effects of benefits are generally small.

The extension of (3) to more than two components is easily realised: a sum of CV^2: s weighted by their respective shares squared and a sum of all pairs of CV products weighted by the product of two times their shares and their correlation, respectively.

The decomposition (3) is simple at least for two components but lacks desirable properties. It is not additive in the CV^2-components since products of linear CV:s are included. There are general problems establishing unique additive decompositions rules for inequality measures, as is obvious from the following discussion, and the choice of method is controversial. The lack of uniqueness for additive decompositions $I(Y)=\Sigma_k S_k$ is shown by Shorrocks (1982,1983). Here I(Y) is an inequality measure for the income distribution $Y=(Y_1,..,Y_N)$ for N individuals, and S_k depends on income from source k. Decomposition rules are easily derived for inequality measures of the type

$$I(Y)=\Sigma_i \, a_i(Y) Y_i, \quad (4)$$

specified as weighted sums of total income Y_i with weights $a_i(Y)$, i=1,. .,N. Total income Y_i adds income sources Y_{ik}, $Y_i=\Sigma_k Y_{ik}$, and a substitution into the definition of the inequality measure (3) yields

$$I(Y)= \Sigma_k\Sigma_i a_i(Y)Y_i =\Sigma_k S_k \,, \qquad (5)$$

after reordering. This equation defines a decomposition given the weights. Often-used inequality measures can be written as (4) but not uniquely. The Gini coefficient is an example, which can be written in alternative forms, yet in accordance with (4) but with differences in the $a_i(Y)$-weights.

One resolution to this indeterminacy is to use a 'natural' decomposition rule following from the usual way an index is written. This is less satisfactory and an alternative is to impose restrictions, at least if those are reasonable. Shorrocks considers two additional restrictions to basic conditions given in a while. The first additional restriction requires that an income source makes no contribution to overall inequality if income receipts from this source are equally distributed. The second assumes that if total income is divided into two components whose factor distributions are permutations of each other, then these two components contribute equally to aggregate inequality. These extra restrictions determine a unique decomposition rule given by

$$R_{Sk} = \mathrm{cov}(Y_k,Y)/\mathrm{var}(Y), \qquad (6)$$

for income component k, writing the contribution of this component as a proportion of total variance. The rule (6) is independent of any inequality measure and incidentally is a natural decomposition rule for the squared coefficient of variation and for the variance.

Compared to the decomposition of the squared coefficient of variance for a total CV_T^2 into the squared coefficients of variance for the components (3) a decomposition according to (6) is simpler and fulfils the following desirable basic properties:

-symmetry (different income components are treated symmetrically and the contribution of the k^{th} component should not be affected by the way components are numbered or named)

-independence (there is no dependence of how many other types of income are distinguished)

-consistency (the sum of contributions equals the value of the inequality index).

The condition of consistency is clearly not valid for (3), in the sense that the sum of the weighted squared coefficients of variance is not equal to the squared coefficient for the total.

However, Shorrocks' first additional restriction that an income source makes no contribution to overall inequality if income receipts from this source are equally distributed, implying that identical lump sum transfers not are an equalising force is questionable, as is recognised already by Shorrocks. This has prompted Paul (2004) to replace the additional restrictions above by two other conditions. These are:

-proportionality (if income component k is a constant proportion of total income then its inequality contribution should be in the same proportion) and

-negativity (the contribution of an income source should be negative if all the individuals receive identical positive income from that source). These conditions are fulfilled by natural decomposition of members of the class of generalised entropy indices, specifically for Theil's T1 written as (4) with $a_i(Y)=\ln(Y_i/\mu) / (N\mu)$, where $\mu=\Sigma_i Y_i/N$. The negativity condition is not fulfilled for the squared coefficient or variance or half of this coefficient written with as (4) with $a_i(Y)= (Y_i-\mu) / (2N\mu^2)$ and also a generalised entropy index, nor is the condition valid for the Gini coefficient written as (4) with $a_i(Y)=(2/(N^2\mu)(i-(N+1)/2)$, corresponding to a frequent way of writing the Gini coefficient. As a consequence some results for Theil's T1 will be provided, as a complement to the coefficient of variance used e g by Benedict and Shaw (1995) in a similar application.

5. Results

Let us first regard the inequality effects of the benefits generally, by comparing Lorenz curves for money wage and wage expanded with the different benefits. A Lorenz curve shows the cumulative proportion of income received by the individuals in a cumulated proportion of the population when the individuals are ordered by income. If all incomes are equally distributed, the Lorenz curve coincides with the 45° line. Inequality shows up in a curve below the diagonal 45° line.

In Figure 1a, Lorenz curves for money wage and total wage are shown. The money wage curve dominates, i.e. is above, the total wage curve indicating a larger inequality for the expanded variable. The curves do not intersect and it appears that total wage is more unevenly distributed at all points. From Figure 1b, we see a similar difference between money wage

and money wage with pension benefits added: the increase in inequality seems to emanate from the pension benefits. This is confirmed by the corresponding Lorenz curves when sickness benefits (Figure 1c) and survivor's benefits (Figure 1d) are added to money wage, respectively. These curves are virtually indistinguishable from the curve for money wage. Whether the 29 individuals with negative total income are included or not makes little or no change in the Lorenz curves, except at the very left end for total income.

Figures 2 and 3 show quantile curves for money wage and money wage with either pension benefits, sickness benefits or survivor's benefits added. In these diagrams we can see how the benefits change the quantiles over the quantile scales. The pension benefits make higher quantiles differ more than lower quantiles while the sickness benefits have a more uniform effect. Note that the ordering between the individuals differ for the curves as it does for the Lorenz curves for different wage measures, this is the explanation for the curve for money wage with pension benefits being below the curve for money wage for the very lowest quantiles.

Figure 1a: Lorenz curves for money wage and total wage.

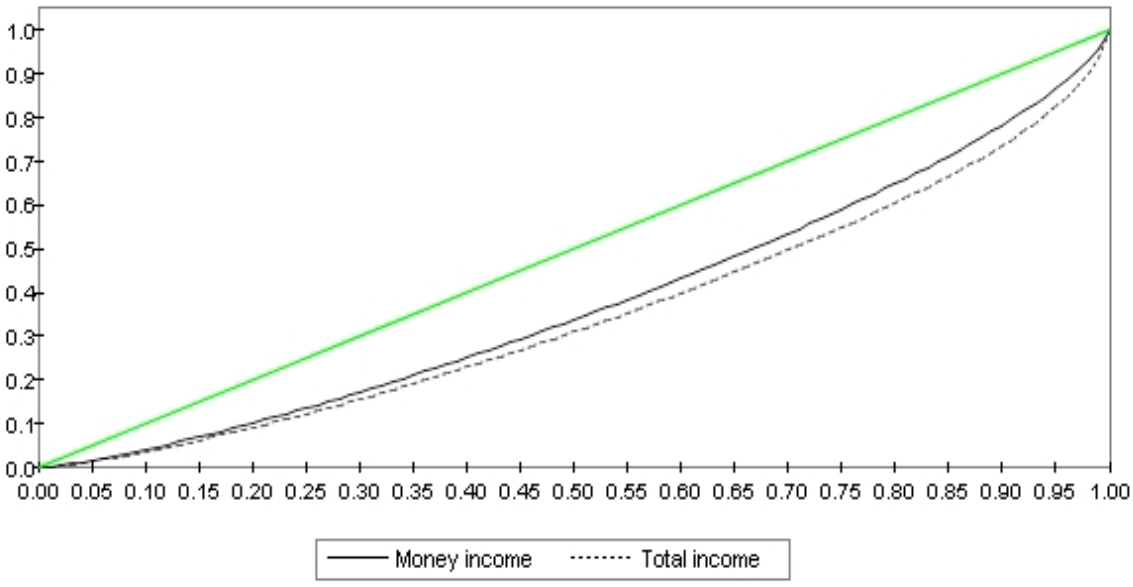


Figure 1b: Lorenz curves for money wage and extended wage; pension benefits.

Figure 1c: Lorenz curves for money wage and extended wage; sickness benefits.

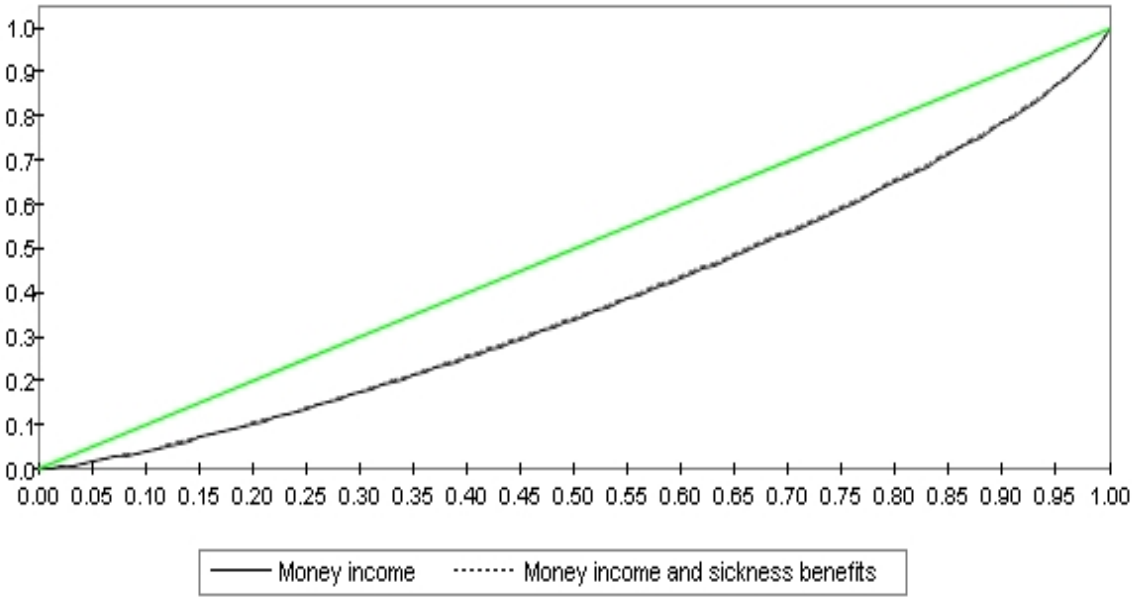


Figure 1d: Lorenz curves for money wage and extended wage; survivors' benefits.

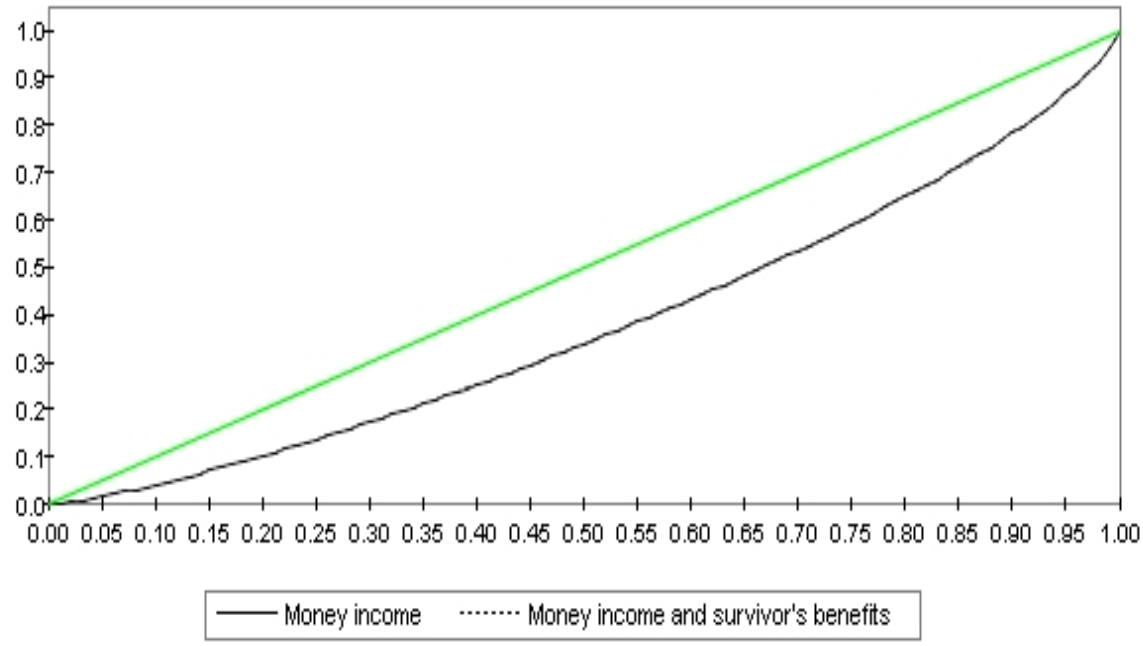


Figure 2: Quantile curves for money wage and the different extended wage measures.

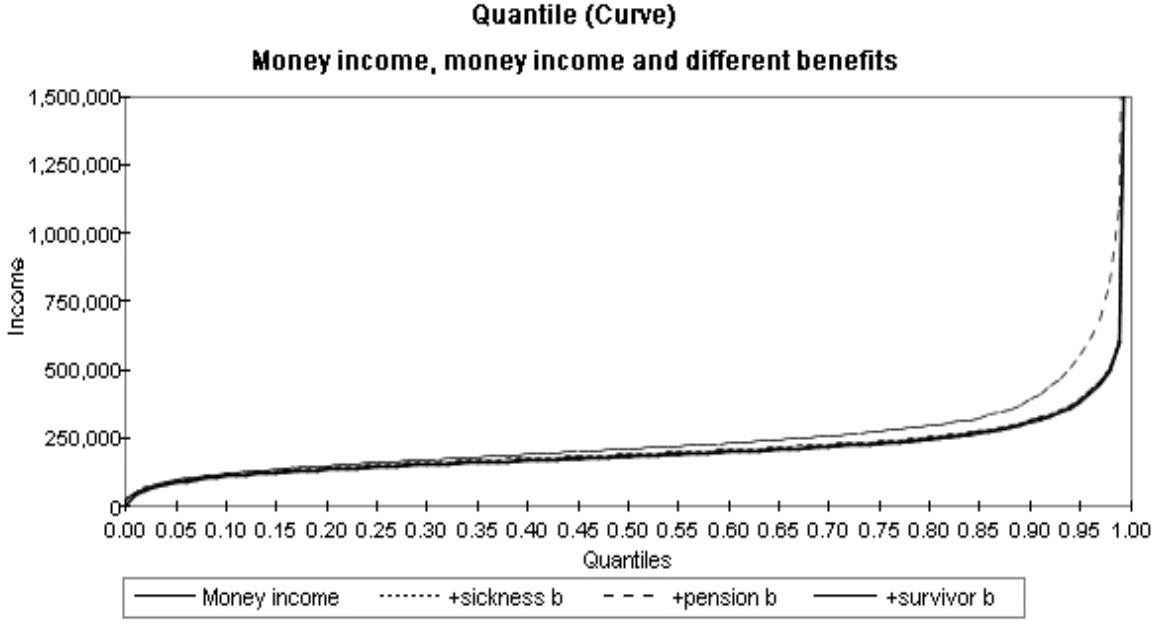
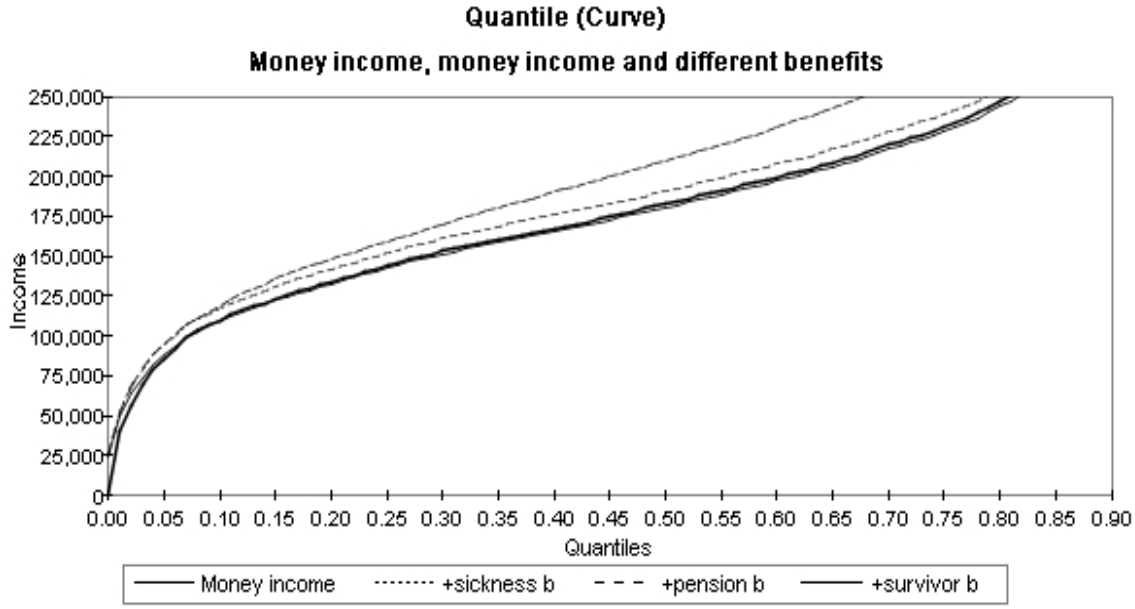


Figure 3: Quantile curves for money wage and the different extended wage measures, quantiles 0 to .90.



Coefficients of variation squared (CV^2) are shown in Tables 2 to 5. We see that the coefficients are much larger for the benefits than for money wage resulting in a value for total wage double the value for money wage for all according to the first row in Table 2. The share of the benefits to total wage is 22 percent and the money wage-benefits correlation is about 0.5, which is sizable. The benefits contribute a bit more to inequality than does money wage, .53 in the last column as compared to the complement 1-.53 or .47. These inequality contributions are calculated according to (6). Within the socio-economic groups the effects of the benefits are relatively small for blue-collar workers and municipal white-collars, while the effects are relatively high for private white-collars. The share of the benefits to total wage is also higher for the latter group. Part of the differences between the groups may be due to differences in working hours and the frequency of part-time work. Closer to results comparing wages are those in Table 3 where fulltime full year workers are described. The restriction decreases CV^2-values for money wage and total benefits with a notable exception for women's benefits. CV^2-values for total wage is about the same as before except for blue-collar workers where the inequality is lower. The effect for the relative contribution is an increase for the benefits for blue-collar workers.

Table 2. Decomposition of the squared coefficient of variation for total wage by source for men, women and different groups.

Group	*N*	*CV^2 Money wage*	*CV^2 Total benefits*	*CV^2 Total wage*	*Share of benefits to total wage*	*Correlation: benefits, money wage*	*Relative contribution to inequality of benefits*
all	10954	0.26	4.13	0.52	0.22	0.49	0.53
men	5425	0.26	4.65	0.55	0.21	0.50	0.54
women	5529	0.16	2.94	0.36	0.22	0.48	0.57
whitecollars							
private	3562	0.35	5.11	0.77	0.26	0.47	0.60
state	755	0.16	1.20	0.28	0.23	0.78	0.45
municipal	1986	0.18	0.42	0.19	0.20	0.70	0.24
blue collars							
private	2906	0.10	0.80	0.12	0.17	0.43	0.32
state	187	0.10	0.55	0.11	0.18	0.40	0.29
municipal	1558	0.08	0.37	0.10	0.20	0.58	0.31

Table 3: Decomposition of the squared coefficient of variation for total wage by source for men, women and different groups. Full-time employed (more than 2000 yearly working hours).

Group	*N*	*CV^2 Money wage*	*CV^2 Total benefits*	*CV^2 Total wage*	*Share of benefits to total wage*	*Correlation: benefits, money wage*	*Relative contribution to inequality of benefits*
all	7000	0.23	4.18	0.51	0.22	0.49	0.57
men	4454	0.25	4.37	0.54	0.22	0.50	0.56
women	2546	0.14	3.52	0.37	0.23	0.46	0.64
whitecollars							
private	2676	0.32	4.97	0.75	0.26	0.46	0.61
state	569	0.14	1.21	0.27	0.23	0.82	0.47
municipal	1223	0.16	0.34	0.16	0.20	0.68	0.23
blue collars							
private	1892	0.05	0.69	0.07	0.17	0.39	0.41
state	110	0.03	0.32	0.04	0.18	0.37	0.36
municipal	530	0.04	0.28	0.06	0.20	0.48	0.36

Results for decomposition of the benefits are shown in Tables 4 and 5. Reading those tables it should be kept in mind that different estimation principles are used for the different benefits. While pension and survivors' benefits are estimated individually, sickness benefits are estimated group-wise, resulting in the same sickness benefit to all individuals within the same socio-economic, sector, sex and age group. The inequality for sickness benefits is similar to the inequality for money wage but probably is understated. The coefficient of variation squared is large as regard pension benefits considering the large groups all, men and women. Private white-collars are likewise unequal. The share of pension benefits is much larger than the shares for the other benefits, with the survivor's benefits only amounting to 1 percent. The relative contribution of pension benefits to total wage inequality is large also compared to the contribution of money wage with exception for blue-collars and municipal white-collars.

In Table 5 benefits are decomposed by source; that is whether the insurance is provided by the state or through bargaining agreements. We see much larger inequality for the negotiated benefits as compared to the social benefits. The shares of social benefits are larger than the shares of negotiated benefits except for private white-collars. On the other hand inequality contributions are larger for negotiated benefits except for blue-collars and municipal white-collars. The CV^2-comparisons are also affected by the different principles of estimation and differences should be interpreted with care remembering that the sickness insurance is mainly public.

The results so far are that inequality increases when compensation is considered instead of money income. The increase is relatively large for white-collar workers, except municipal white-collars, but relatively small for blue-collar workers. Pensions benefits seem more important for this result than sickness benefits and survivors' benefits; likewise negotiated benefits seem more important than social benefits.

Table 4 Decomposition of the squared coefficient of variation for total wage by money wage and different benefits for men, women and different groups[3]

		CV^2					Share of total			Relative contribution to inequality			
Group	N	money wage	sickness benefits	pension benefits	survivor benefits	total wage	sickness benefits	pension benefits	survivor benefits	money wage	sickness benefits	pension benefits	survivor benefits
All	10954	0.26	0.24	6.80	1.40	0.52	0.04	0.17	0.01	0.47	0.01	0.52	0.01
men	5425	0.26	0.32	7.09	1.44	0.55	0.03	0.17	0.01	0.46	0.01	0.53	0.01
women	5529	0.16	0.17	5.39	0.98	0.36	0.05	0.16	0.01	0.43	0.02	0.54	0.00
white collars													
private	3562	0.35	0.42	6.51	1.23	0.77	0.02	0.23	0.01	0.40	0.01	0.58	0.00
state	755	0.16	0.26	1.56	1.48	0.28	0.03	0.19	0.01	0.55	0.02	0.42	0.02
municipal	1986	0.18	0.19	0.61	1.03	0.19	0.04	0.14	0.01	0.76	0.03	0.20	0.01
blue collars													
private	2906	0.10	0.13	1.88	1.38	0.12	0.06	0.10	0.01	0.68	0.04	0.27	0.01
state	187	0.10	0.12	1.06	1.15	0.11	0.05	0.12	0.01	0.72	0.04	0.23	0.02
municipal	1558	0.08	0.08	0.81	1.12	0.10	0.07	0.12	0.01	0.69	0.05	0.25	0.01

[3] Sickness benefits imputed groupwise

Table 5: Decomposition of the squared coefficient of variation for total wage by negotiated and social benefits for men, women and different groups[4]

		CV^2				Share of total		Relative contribution ineq.		
Group	N	money wage	Negoti-ated benefits	social benefits	total wage	negot. benefits	social benefits	money wage	negot. benefits	social benefits
All	10954	0.26	28.74	0.45	0.52	0.08	0.14	0.47	0.47	0.06
men	5425	0.26	19.90	0.41	0.55	0.10	0.11	0.46	0.50	0.04
women	5529	0.16	50.42	0.48	0.36	0.05	0.17	0.43	0.44	0.12
white collars										
private	3562	0.35	14.91	0.49	0.77	0.15	0.11	0.40	0.56	0.04
state	755	0.16	4.52	0.44	0.28	0.10	0.13	0.55	0.37	0.08
municipal	1986	0.18	6.70	0.38	0.19	0.03	0.17	0.76	0.09	0.15
blue collars										
private	2906	0.10	21.34	0.43	0.12	0.02	0.15	0.68	0.13	0.19
state	187	0.10	3.99	0.46	0.11	0.04	0.14	0.72	0.09	0.20
municipal	1558	0.08	5.45	0.40	0.10	0.02	0.18	0.69	0.03	0.29

That money income contributes more to total income inequality than the benefits for blue-collars while the opposite holds for private white-collars according to the decompositions fits the picture. Let us however also consider results for Theil's T1, a measure which has the property of negativity according to section 4, that is here an identical lump sum transfer to all is an equalising component in a decomposition. Theil's T1 is not defined for negative income, so let us first consider results for CV^2 ignoring the 29 observations with negative total income. Then CV^2 decreases from .26 to .25 for all while the contribution to inequality for total income from money income increases from .47 to .49. Theil's T1 for all is .16 with a contribution of money income amounting to .37, that is here money income is less important than for the coefficient of variation. For private white-collars the money income contribution decreases from .43 to .25, that is considerable more than for private blue-collars where the decrease is from .68 for CV^2 to .59 for Theil's T1. Both measures belong to the class of single parameter generalised entropy measures with parameter 1 (Theil's T1) and 2 for $CV^2/2$. The more positive the parameter is the more sensitive the measure is to income differences at the top, therefore is reasonable that the differences between the $CV^2/2$ –values for private blue-collars of .06 and for private white-collars of .35 are larger than the corresponding differences for Theil's T1 where the values are .06 and .23 respectively. For both groups

[4] Sickness benefits imputed groupwise

however, the relative importance of the benefits is smaller according to $CV^2/2$ than for the other measure.

6. Conclusions

Using standard methods of income inequality measurement we find that insurance benefits increase annual income inequality (relative to inequality observed in the distribution of wage income) by 100 percent for CV^2, or equivalently by 40 percent for the coefficient of variation, CV. The share of the benefits to total wage is 22 percent and the correlation between money wage and benefits is about 0.5. The increase in inequality emanates from the pension benefits. The effects of sickness benefits and survivors' benefits are small. The effect of the benefits is minor for blue-collar workers and for municipal white-collars, while the effects are high for private white-collars. According to decomposition of inequality by income source, the importance of the benefits is larger than their share. Compared to results for the U.S. and for pension benefits, according to Benedict and Shaw (1995), the share of the benefits are about 7-8 times larger here, the correlations between benefits and income are larger, as well as the impact of benefits on compensation inequality.

Wage regressions are an alternative way to display the effects of the incidence of benefits. In Granqvist, Selén and Ståhlberg (2002) it is examined whether an extended wage measure for the traditional earnings equation affects the gender gap or the returns on human capital using the same data set as in this study. The results demonstrate that the returns to human capital investments are underestimated when benefit income is omitted.

To sum up, the results indicate that money wage only is a too narrow measure to describe the extent of compensation inequality.

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